1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

312 construction requires a great amount of skill. Where the sides of the valley are precipitous and rocky, the ditches are led around through olive logs hollowed out with the adze and supported by long wooden props; at times ditches are led even from one side of the valley to the other by means of these olive-wood troughs. The distribution of the *targa* coincides with that of *tikerathin*, or terraces, except in the lowland alluvial plains of Ajdir, Tiguisas, and other Mediterranean deltas, where irrigation is carried on without terraces. Irrigation is locally supposed to have been invented by the men of Iherrushen and Ikhuanen in the northern Gzennaya, and expert *targa* makers from these places are sent for to construct and repair ditches all over the Rif.

hassi, the well. Wells are constructed by itinerant craftsmen from the region of the 463 Drna, who wander about throughout the Rif seeking employment. They are never molested, since they are considered benefactors of mankind, and are paid well for their work. These 465 men generally earn as much as twenty dollars for the construction of an average well, and find employment chiefly in flat arid country where there are no springs and where wells are a necessity.

241 **Communism in Agriculture.** The Riffians, living as they do close to the soil and often not distantly removed from the prospect of starvation, have developed several social de- ●735 vices whereby the poor may be prevented from perishing and the rich compelled partially to support them. These charitable practices are so ingrained that no one able to act as a 476 benefactor to the poor would venture to criticize them in public or refuse to take part in them. They concern the three vegetable products which seem most deeply entwined with Riffian life: rye, grapes, and olives.

When a man wishes to sow rye on a mountain slope, he invites as many men as wish to do so to help him. Most men who have nothing else of importance to do accept the offer, and no one refuses without an adequate excuse. In this way a man of moderate means is assured of a plentiful crop of rye, to make up for his lack of other foodstuffs.

The crew works diligently from sunrise to sunset, after which they climb downhill to the house of the owner of the rye. The latter's womenfolk have meanwhile busied themselves preparing as ample a meal for the workers as the family's means will allow, and all eat and spend the evening together. If the family cannot provide very abundant rations, the workers seldom complain, since they consider their participation in the work as a form of charity, and their partaking of the food as a social gratification to the providers of it.

Similarly, in reaping season, anyone who wishes may come unbidden and help gather in the grain, whether it be rye, barley, or wheat, and is assured of an adequate meal at the end of the day in payment. In this way people who have finished their own work may be fed without drawing on their own supplies. Gleaning is left to the poor of the village.

241 If two farmers who own adjoining fields or terraces possess each but a single cow, they 476 yoke these together and plough their land in common. No family is without a cow, and since ploughs are constructed by the farmers themselves, or by neighbors especially adept at the art, without payment, the situation of a man with land and no cow or plough does not arise.

241 Irrigation ditches which water the tillage of more than one man are subject to communal 312 care. Each farmer is assigned a definite amount of water during each season when it is required, the amount depending on the amount of land requiring irrigation. The water is measured by days and half-days. Each season the farmer must send out a man for every

1: Coon E-5 (1926-1927) 1931 MX3 Rlf MX3

day's water he receives, to work a day repairing the system after the heavy rains. Farmers who have each but a half-day's water pair off and draw lots to see which will work, since no one is allowed to work half a day only.

At the arrival of the grape-picking season, all the poor families who have no vines and the rich landowners who have many, assemble in the village mosque, on a Sunday, chosen for this occasion because it is considered a lucky day for grapes and supposed to be immune from thunderstorms. Before this date no one may pick grapes. The local administrative council, which has summoned the families now present before it, assigns to each rich family a poor one, all members of which are to help the vine owners. The aides thus chosen assist the others in picking their grapes, washing them in *fathi* ash and water, and in setting them out to dry. No group may begin picking until all assignments have been made. After the work is done and the raisins have been dried, the rich family gives its helpers a generous quantity of the raisins. There is no set rule dictating how much shall be given, but the families benefiting from this form of charity seldom have cause to complain. If after the allotment of families there are some poor ones still remaining, the council sets them to work picking the grapes which are the property of the local mosque or saint's tomb. The workers who pick and cure these grapes are given a fourth of the product.

All the olive trees in a village, although owned by a number of different individuals and by the mosque or by a saint's tomb, are located together on the banks of the nearest stream, below the lowest terrace. The shaded area beneath the trees is a place for various types of gatherings, one of which is directly concerned with the trees themselves. When the olives are ripening and windfalls begin to collect on the ground beneath the trees, the administrative council sets the first Friday of this season as the official day for gathering them. Early in the morning most of the families, especially the poor ones, come to the olive grove and await the arrival of the council members. The latter give the signal to start, upon which the people rush under the trees and gather up the windfalls. They are not allowed to touch any olives on the trees or to start before the signal is given.

Each olive tree owner's name is written on a list in the possession of the *adl*, an officer comparable to a town clerk. A farmer is allowed to use the grinder and press, which are communally owned, only when his turn has come around. He may employ it only for a certain number of days, depending on the amount of olives his trees are capable of producing. In this way he is prevented from idling or wasting his time at the press. During the time he is there, he is required to give one cup of oil each day to each of the following:

1. The *fkih*, who keeps half of it for his personal use and saves the rest for the lamp in the mosque. This is called the cup of the mosque.
2. The *mokaddem*, or caretaker, of the mosque, who collects a cup to be sold or stored, the proceeds to be reserved for hospitality, cartridges for the village, and fines imposed upon the whole village. This is called the cup of the grinding wheel.
3. The students in the local primary school, who collect a cup which they sell or consume as food. This is called the cup of the students.
4. If there is a saint's tomb in the territory of the village, a fourth cup must be given it for its lamp.

1: Coon E-5 (1926-1927) 1931 MX3 Rif MX3

Any oil remaining over the three or four cups so given is the property of the man who has pressed it, unless a poor man without trees comes to the press and asks for some. Such demands cannot be refused and each suppliant must be given a cup.

Besides charitable assistance and work done in anticipation of remunerative charity, there are two types of definite agricultural contract by which one man who has not enough land to support himself and his family may acquire sufficient provender to last his household through the winter. The first is that by which a poor man binds himself to assist a richer farmer in all agricultural tasks in which he may engage. In return for this he receives a fifth of the total grain crop, a fourth of the leguminous plants and vegetables harvested, a third of the product of the fruit, olive, and nut trees, and a third of the grapes.

The rich farmer hires these share-laborers (who are called *akhemes*,[1] plural *ikhemesen* or "fifths," because of their return in grain) because he is not able to care for all of his land himself, owing to its extensive size. If the property of a rich farmer is so extensive that he is unable to cultivate it with the aid of one share-laborer, he will hire two, and these will split a fifth, a fourth, and a third of the various types of produce. No matter how many men a farmer employs he never gives more than the stipulated fractions, which are equally divided among the workers.

When a man owns property which he has no intention of working himself, he can rent it out in return for one half of the produce. This type of contract is used by the Beni Bu Yahyi in renting out the northerly portions of their territory to farmers who come down from Galiya to work the land, the Beni Bu Yahyi not being as interested in agriculture.

The share-laborer is often a stranger in the village of his employment, having left his home through shame of having his poverty advertised in his own village, or more often through fear of punishment for some crime. The migrations of these share-laborers has done more to cause infiltrations of blood from tribe to tribe than any other factor, since the immigrant usually marries into the group of his adoption.

Wealth is not a stable thing in the Rif, any more than it is in more modern types of society. Despite charitable practices and opportunities for outside work, many families find themselves on the verge of starvation in or near January and February, and are willing to sell anything within reason to obtain enough food to last them until the next harvest. Others, more industrious, who have worked their land to its limit and spent the rest of their time helping others for pay, may have more food than they require and be willing to sell some of it, at a premium. They generally demand land in payment. Working this land to its limit the following year, they may pile up an even greater surplus than before, and thus before many years may become large landowners and relatively rich men, ready, in their turn, to hire as share-laborers the people from whom they bought the land.

Thus the retention of property depends upon whether or not it is worked diligently, and positions of wealth may be reversed in less than a generation.

FOOD PREPARATION AND EATING

The different types of food, including their methods of preparation, may be classified as follows: (1) cereal preparations antedating bread, (2) bread and breadmaking, (3) preparation of vegetable products alone, (4) dishes containing meat, (5) fish, (6) eggs, (7) milk and

[1] The feminine form of this word signifies a political division. See p. 92.

796 782 [120] It is the rule that as soon as the animal[1] is killed its head and feet are cut off. The women seize hold of them in great haste and singe off the hair as quickly as possible (Dukkala, Hiaina, Ait Sadden, Ait Nder, At Ubahti). In Dukkala it is believed that if they do not do this rapidly their own hair will not grow; but the original reason for the practice in question seems to be the belief prevalent among some Berber tribes (Ait Waryager, Ait Nder) that the smoke of the hair drives away evil spirits or protects from other evil influences as well.

The part of the sacrificed animal which is to be eaten first is generally the liver, although in some instances it is only partaken of [252] on the second day of the feast. It is either roasted or boiled with salt. The other parts of the animal are eaten in a fixed order, which, however, varies in different tribes or in different families. Very frequently the lungs and the stomach (Fez, Shraga, Hiaina, Mnasara, Andjra, Ait Waryager, Temsaman, Ait Warain, Demnat, Amanuz), as also the heart (Shraga, Hiaina, Mnasara, Andjra, Ait Warain, Demnat, Amanuz), are partaken of on the first day, and the head (Tangier, Shraga, Hiaina, Mnasara, Andjra, Temsaman, Ait Warain, Demnat, Amanuz) and the feet (Tangier, Shraga, Hiaina, Andjra, Temsaman, Ait Warain, Amanuz) on the second; but sometimes the lungs, stomach, and heart are eaten on the second day (Ait Sadden), and the head and th the feet on the first (ibid.) or the third (Ait Waryager). The flesh is almost universally abstained from on the first day.

[262] [121] Among the Ait Temsaman and the Ait Waryager children are not allowed to eat the throat, because it has been cut with a knife; the former also prohibit them from eating the eyes, while the latter maintain that if two boys should eat together the same eye they would quarrel.

[251] What remains of the meat is made into qaddid (or geddid [Ulad Bu 'aziz], lqaddid [Igliwa], rqaddid [Temsaman, Ait Waryager], tiqqaddidin [Ait Sadden], asawar [Ait Yusi], tagarin [Aglu], tifiyi iqorn [Amanuz]), that is, the meat is salted and cured in the sun in strips.

●[735] A portion of the qaddid is generally given in charity to poor people. We have previously seen that some of it, or something else of the sacrificed animal, is left to be eaten on the eve of the following 'asura. Among the Ait Waryager some qaddid must be preserved till the following mulud.

[1] [i.e. - sacrificial, - Analyst]

796 805 jebha, 18th-31st July; l-harat an (l-haratan), 1st-13th August; s-sarfa, 14th-26th August; l-'auwa, 27th August-8th September; s-samak, 9th-21st September; l-gafar (l-gafar), 22nd September-4th October; j-janaban, 5th-17th October; l-iklil, 18th-30th October; l-qalb, 31st October-12th November; s-saula, 13th-25th November; n-nu'aim, 26th November-8th December; sa'd l-belda, 9th-21st December; d-dabeh, 22nd December-3rd January; sa'd bla' (sa'd l-bula'), 4th-16th January; sa'd s'oud (sa'd s-su'ud), 17th-29th January; l'ahbiya, 30th January-11th February; farg l-moqaddam, 12th-24th February; farg l-mohhar (farg l-mu'ahhar), 25th February-9th March; batna l-hot, 10th-22nd March.

The year has four seasons (fosol, sing. fasl). Spring (fasl ar-rbe'a) commences on 15th February, summer (s-saif) on 17th May, autumn (l-hrif) on 17th August, winter (s-set wa) on 16th November. The forty days between 12th December and 20th January inclusive are called liali, and the forty days between 12th July and 20th August inclusive are called s-smaim or s-smaim.

To various dates of the solar year magical qualities are ascribed, and this leads to the observance of many positive rites and taboos.

796 [162] The Ait Waryager call the last day of the old year and the first day of the new imgaren, "sheikhs".

[166] The Bni 'Aros eat siyoha on New Year's eve and sfen j on the next day. The Ait Waryager eat eggs and wheaten bread on the former occasion and seksu with fowl on the following evening.

[169] Among the Ait Waryager women who have cows and are in the habit of making butter go on New Year's day to a scribe and procure from him a charm which he writes with a needle on a bullet; this charm is hung on the wooden hook (ashum) from which the earthenware churn (aqasror) is suspended, and is left there till the following New Year as a protection against witchcraft.

[765] [735] [174] The Ait Waryager, again, take on New Year's morning iuzan, or porridge, to the graves of their deceased relatives and distribute it in charity to children and poor people.

[178] At the same time I have also found quite the contrary belief, that it serves as a protection against snakes and scorpions by making them blind if it touches their eyes (Tetuan, Andjra, Bni 'Aros, Tsul, Ait Sadden) or even killing them (Tetuan, Ait Waryager, Ait Warain), whereas if there is no rain in the nisan their eyes are said to become like fisan (hoes) and their mouths like kisan (cups).

4: Hart E-5 (1953-1954)1957 MX3 Rif MX3

canvas tents in the Market of the Righteous, as they would do in any ordinary tribal market (*sūq*). They sell just the same articles, from clothing and bill-hooks (I purchased two of the latter here) to soap and matches, as they do in the regular markets, and some of them also sell sheep to be ritually slaughtered for the 'Aid al-Kabīr on the following day. As in a normal market, also, men and women remain sharply segregated.

Among the pilgrims are numerous *ṭulbā* or students of the Qur'ān, who, after visiting the tomb, where they recite the Holy Book from beginning to end, proceed to the Market of the Righteous to ask the faithful for contributions (*ma'rūf*), which are placed in a box beside the tomb put there for the purpose. The money is later counted up by the tribal authorities and divided equally among all the ṭulbā attending (1).

The 'imārah of Sīdī Bū Khiyār has also, within the last two decades, become a focal point in the activities of the local members of the brotherhood of the 'Alawiyyīn, who maintain a not insignificant following in Timarzga and Aith 'Arūs, although they do not have a lodge in either of these districts. After paying their respects to the saint, they congregate for their *miima'*, or reunion, at a spot between the ādhān grove and the mosque. Here, for an hour and a half to two hours, they go through the litany (*dhikr*) required by their order. This consists of a constant repetition of the formula *Lā ilāha illā 'llāh*, «There is no god but God», over and over, while the brethren are standing in a circle. The litany is followed by the *'imrah*, a form of rhythmic breathing designed to induce ecstasy: and the 'imrah of the 'Alawiyyīn (the word is *not* to be confused with *'imārah*) progresses through the following routines, in which the underlined and accented vocalizations denote outgo, and the non-underlined ones, intake, of breath:

(1) In 1955, there were 99 ṭulbā from the Ibīl (Timarzga-Turīrth, Aith 'Arūs) of Aith Warivāghir, who collected 717.75 pesetas: 96 from Aith 'Abd Allāh of Aith Warivāghir, who collected 696.00 ptas.; 87 from Aith 'Ammarth, who got 630.75 ptas.; 75 from Aith Bū 'Ayyāsh of Aith Wariyāghir, who got 471.25 ptas.; 39 from Aith Hadhīfah of Aith Warivāghir, who received 282.75 ptas.; 15 from Imrābdhen of Aith Warivāghir, who got 108.75 ptas.; and 10 from Izzinnāven, who received 72.50 ptas. Total ṭulbā attending were 421, and total money collected was 2990.25 pesetas.

[Text continues on p. 243]

4: Hart E-5 (1953-1954)1957 MX3 Rif MX3

708
778
171

This is all that happens at the shrine of Sīdī Bū Khiyār, and no more. There is a complete lack of the «sensational» aspects of certain other Moroccan pilgrimages, and even the behavior of the 'Alawiyyīn is fully under control. The whole thing is carried off with a maximum of correctness and decorum: the tribesmen gravely pay their respects to the memory of their saint by placing a *ziyārah* in money, which is later distributed among the ṭulbā as charity, in the box beside his tomb; and then they pray. Nevertheless, the fact that they do so haltingly and imperfectly, in a language which is foreign to them, is, in a sense, a reflection of the Berber outlook on Islam as a whole: although they have taken to it unanimously and unquestioningly, their acceptance of it has, in the long run, been very largely, if not entirely, on their own terms and conditioned by their own culture.

[735]

OOC 53--This is probably Aith Tizi, forming a part of the larger jma'th of Ighmiren, with Aith Fars.

54--Whether all the Aith 'Adhiya jointly sacrificed two bulls, or whether one each was sacrificed by the members of each liff is not indicated.

55--The market in question is the Monday Market of Aith Bu 'Ayyash.

[671] 56--In both this qanun and that of the Aith 'Abdallah we see how the fine for murder committed in the market is double that for murder elsewhere. Both qanuns also imply that not only must the fine be paid but that the murderer's house and crops will be burned as well. All informants from all over the Central Rif, however, said time and again that if the fine is paid, there is no houseburning. The root of the [735] discrepancy seems therefore to be an implicit assumption that the average murderer is too poor to pay the fine, which is in any event prohibitively high.

57--In some respects one can see what Blanco means here, but such a statement, particularly regarding the "superficiality" of Rifian Islam, is one which the Rifians themselves would hotly and vehemently deny. In their own eyes, they are extremely good Muslims!

[262] 58--Rifians tend to eat meat, as a rule, only on one day of the week: when they buy and bring it home from the market.

[114] [682] 59--Blanco here confuses the ddiyith, or blood money, to be paid to the victim's agnates, with the rhaqq, or fine for murder, to be paid (both payments being made by the murderer and his own agnates) to the council-members.

[682] 60--Blanco's point about 1000 duros being the fine for murder under normal circumstances (i.e. outside the market) and 2000 for murder inside it is very well taken; and, as he implies, these sums are indeed the norm all over the Rif. But once again, he confuses fines with blood-money, and they are entirely different.

61--Again, read rhaqq or fine.

62--Again, read rhaqq or fine.

[114] 63--This is an interestingly expressed idea, but the linkage with nomadism seems questionable.

[614] 64--As already indicated, the Aith Khattab include the two Waryaghar clans of the Aith Yusif w 'Ari and Aith 'Ari; and in this sense they might be considered a "super-clan", particularly if, as some have it (though this is nowhere indicated in the text of the qanun), they embrace the Aith 'Abdallah as well. In the same way, Aith Bu 'Ayyash, if it embraces, on the topmost level, the two clans of the Aith Bu 'Ayyash and Aith Hadhifa, may also be regarded as a "super-clan" of the same order of segmentation. However, the group in question is referred to as Bani Khattab, not Aith Khattab, in the text of the qanun.

65--As indicated, this qanun is valid only for the coastal Aith Khattab, those of both Aith Yusif w 'Ari and Aith 'Ari who live in and around the Plain of Alhucemas, bordering the Mediterranean.

792 (real or putative) in such matters, his reputation expanded from
796 a localized base to a regional and even a national one. Upon the
792 death of a holy man a shrine would be erected to serve as a per-
796 manent place which the tribesmen could visit. To such places the
798 Berbers come to petition for divine intermediacy. They seek rem-
788 edy for ill health, barrenness, and so forth, either on their own behalf or for a friend or relative. Although pilgrimages can be made at any time, there are also various saints in the Rif that attract several thousand people on specific celebration days. These communal affairs are annual events and must be added to the schedule of pilgrimages for individualistic causes. The part of the pilgrimage which shall concern us is the economic aspects.

792 The expense of such a pilgrimage depends on several factors.
796 There is always a sacrificial element but the type of animal to
798 be killed is not specified. It is generally believed that the
788 more costly the sacrifice the greater the baraka that the saint
782 will pass on. Thus although chickens are often used, a lamb or goat is preferred to increase the efficacy. The sacrificial animal itself is divided three ways, with the pilgrimage party receiving a third which is consumed on the site. Another third
[794] goes to the moqaddem who is in charge of maintaining the shrine,
[735] and the final third goes to the poor who live in the vicinity of the tomb.

788 As an example of the costs involved in even a short pil-
778 grimage to a local shrine, we might examine the pilgrimage of a
435 group of eight women and four men who were traveling to the

443 651 648 438 [123] Below is the official tax rate of the Spanish as given in Albéniz (1930:121-122). I have no schedule of my own because of a disinclination on the part of officials to give me such information.

Articles upon which a tax is paid entering the market:	
A load of fruit	0.75 Spanish pesetas
Basket of vegetables	0.75
Basket of fish	1.50
Kilo of honey or butter	0.40

Articles upon which a tax is paid upon leaving the market by the large-scale buyers:	
Wool	5% of total value
Straw mats	0.25 each
Dried cereal	0.50 quintal
Goat or lamb hide	0.20 each
Cattle hide	0.50 each

Articles upon which a tax is paid at the moment of exchange:	
Horses	5% of the value of the sale
Mules	5% of the value of the sale
Donkeys	5% of the value of the sale
Firewood, a quintal	5% of the value of the sale

Articles upon which a tax is charged when entering the market and again upon being sold:	
Basket of wool	.10 and .20
Chickens and wild fowl	.10 and .10
Eggs (dozen)	.10 and .10
Carbon (a sack)	.10 and .10

443 651 648 438 ● 735 While Albéniz's list follows the general lines of present taxing policy, there have been some changes aimed at helping the poor. For example, small lots of fruit, vegetables, nuts and eggs can enter the market without paying a duty. Revenue is collected for

443 651 438 648 [735] [276] such items if they are purchased by the large middlemen merchants who pay the tax upon leaving the suq. Because of governmental tax and conservation laws, carbon is rarely sold in the free market but rather in the black market. The narcotic kif, which undoubtedly is a major trade item, also is in the province of the black marketeer. Missing from Albéniz's list are almonds, which have become an increasingly important cash crop. Almonds enter the market free in small lots, are bought by large-scale merchants and taxed upon departing from the market.

443 After paying his tax, the seller enters the market and goes to the area occupied by traders of his particular commodity. There are no market rules demanding that a seller go to a special place but areas have by custom been developed for each type of goods. Those people selling an unusual commodity or unique service set up shop wherever they desire as long as it does not interfere with the operation of the market.

443 438 In the following I shall outline the sorts of commodities brought to the market and the categories of people involved in marketing them. The composition of the agricultural products varies greatly with the season. Tomatoes, green peppers, and other vegetables are available only in the summer and early fall. For a short period during the fall, fruit is in overabundance. Potatoes, maize, garlic, and onions appear throughout the year, though again the supply varies. There are always large stacks of unmilled barley even though this is supposed to be the main crop of the region. That the fellah have to buy barley on

443 buy animals from the local tribesmen, have them inspected by a
445 local official (a practicante; there is no word in tamazight for
463 this innovation introduced by the Spanish), kill them, cut the
231 meat up and sell it. Since it is impractical for most Riffians
(556) to kill an animal for meat unless there is a special social
occasion, this service of packaging meat in small lots provides
the better-off fellah family with the only meat it eats during
• (735) the week. The poor, of course, cannot even afford this luxury.
443 Besides the butchers, there are also barbers, blacksmiths, sol-
445 derers, shoe repairmen, and food vendors. The latter consist
(265) of a group of men located to one side of the market who prepare
(785) and sell fried green peppers, eggs, and sardines. They are the
(796) market group most severely affected by the religious month of
Ramadan, since eating food during the days of that month is pro-
hibited, and they go on a monthlong vacation. People engaged in
445 services of this sort, iron workers, blacksmiths, shoe repairmen,
565 and weighers of grain, form a special social class of imziren,
or shameless ones. Such public occupations, while necessary,
are socially disapproved of and members of this group are thought
to have relinquished all connections with their tribe and are
wandering about from market to market in search of a living.
445 The most common explanation (given by the fellah not the imziren)
565 for their being where they are is that they have lost their land
423 sometime in the past and must engage in such occupations. Since
loss of land through feuding did take place, this explanation is
plausible. On the other hand, some imziren musicians with whom

7: Mikesell K-4,5 (1955-1957) 1961 MX3 Rif MX3

sive pilgrimages to the tombs of both Mulai Idris and Mulai Abd al-Salam are equal to one to Mecca." The fast of Ramadan is strictly observed even in the remote highlands, but many Berbers are extremely casual about prayer, and the idea of almsgiving, in the sense of an income or head tax, was never accepted by free tribes. On the other hand, most tribes promptly accepted the Qur'anic distinction between what is *halal* (clean, or permitted) and *haram* (unclean, or forbidden). Thus carnivorous animals and birds of prey were excluded as food, and also eels and mackerel, since they were supposed to be unclean feeders. Consumption of wine ceased, although vineyards are still numerous and raisins are an important food. A generation ago the Berbers probably hunted the wild boar and may even have kept domestic pigs, but there is evidence that the latter practice continues."

There is nothing blind or unreasonable about Berber conservatism. Once the value of an innovation has been established, it is accepted without reservation. Berber agriculture today is a blend of crops and methods derived from diverse contacts during millennia. Some of the contributions of the Arabs are easy to discern; others are not. The Romans and Phoenicians both contributed to North African skill in irrigation, but the Arabs added refinements in technique." It is not known whether the Arabs or the Romans introduced the Persian system of underground infiltration tunnels (*foggara*), but the Arabs seem to have brought this system to Spain." It cannot be asserted that the Arabs introduced the date palm, for there is reason to believe that palms were cultivated in the Fezzan in classical time." The Latin name for the pomegranate, *Malum punicum* (apple of Carthage), suggests that it was cultivated in northern Africa long before the Arabs arrived. Barley and wheat, the basic cereals, were cultivated before the arrival of the Phoenicians. The Arabs may have been responsible for the introduction of hard wheat (*Triticum durum*), which is still used for semolina. *Triticum dicoccum* has been found in the Roman ruins of Timgad and Djemila." The ubiquitous wheat at present is *T. aestivum*. The initial dispersal of rye seems to have been as a weed in wheat fields, and it was probably carried to northern Africa by the Phoenicians or the Romans. Sorghum was cultivated in eastern and west-central Africa in Neolithic time. The races of sorghum now cultivated in Morocco (*Sorghum vulgare ssp. dura* and *ssp. cernuum*) presumably originated in Egypt or the Upper Nile; it is not known when they arrived in Barbary. The introduction of barley may have taken place in prehistoric time, perhaps when the Berbers themselves arrived. The Arabs may have been responsible for new dispersals of the dromedary (which had been brought to Tunisia by the Romans), but the other domestic animals were known throughout northern Africa in Neolithic time.

Thus the basic elements of north African agriculture were already present

" D. M. Hart, "An Imarah in the Central Rif: The Annual Pilgrimage to Sidi Bu Khlyar," *Tamuda*, 4 (1957), 239–245.

" Coon, "Tribes of the Rif," p. 41, cited in note 4.

" The Spanish word for "irrigation ditch," *acequia*, shows little change from the Arabic *al-saqiyah*.

" G. B. Cressey, "Qanats, Karez, and Foggaras," *Geog. Rev.*, 48 (1958), 27–44.

" Herodotus, *History*, IV, 183. See also Aug. Chevalier, "Les productions végétales du Sahara," *Revue de Botanique Appliquée et d'Agriculture Tropicale*, 12 (1932), 711 ff.

" André Haudricourt and Louis Hedin, *L'Homme et les plantes cultivées* (4th ed., Paris: Gallimard, 1943), p. 115.